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AUTHOR Reynolds, Arthur J.
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ABSTRACT

This study examined the factors contributing to the early school adjustment of children at risk of school failure from preschool enrollment to fourth grade. A longitudinal model that used data on 1,255 low-income, minority children was tested in an effort to bring about an improved understanding of the factors that influence a wide range of early school outcomes. Outcomes concerned included cognitive readiness at the time of school entry, cognitive and teacher-rated adjustment in first grade, and four measures of school competence in fourth grade: (1) grade retention; (2) cognitive achievement in reading; (3) teacher ratings of school adjustment; and (4) children's perceptions of school competency. Results indicated that children's school adjustment from kindergarten to fourth grade was marked by declining achievement, frequent moves from one school to another, and increasing grade retention. Regression analyses indicated that cognitive readiness and the early adjustment indicators of first grade reading achievement and teacher ratings were significantly related to fourth grade outcomes and substantially mediated the effects of readiness attributes of preschool participation and family background measures. Findings also showed that parent involvement in school was positively related to achievement and teacher ratings of children's progress in school. (SH)

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Early School Adjustment of Children at Risk

Arthur J. Reynolds

Northern Illinois University

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Early School Adjustment of Children at Risk

Abstract

This study examined the factors contributing to the early school adjustment of children at risk of school failure from preschool enrollment to grade 4. Using data collected on a panel of 1255 low-income minority children, a longitudinal model was tested with four major outcomes: grade retention by grade 4, cognitive achievement in reading, teacher ratings of school progress, and child perceptions of school competence. The model consisted of school readiness attributes (i.e., sociodemographics and preschool participation), early adjustment indicators in kindergarten and grade 1, and intervening support-based and school life-events. Results indicated that children's school adjustment from kindergarten to grade 4 is marked by declining achievement, frequent school moves, and increasing grade retention. Regression analyses indicated that cognitive readiness and the early adjustment indicators of grade 1 reading achievement and teacher ratings were significantly related to grade 4 outcomes and substantially mediated the effects of readiness attributes of preschool participation and family background measures. The school life-event of grade retention had a strong negative effect on achievement after adjusting for the effects of prior measures including initial achievement. The support-based factors of years receiving kindergarten follow-up services and school mobility were not significantly related to grade 4 outcomes, although a third factor, parent involvement in school, was positively related to achievement and teacher ratings of school progress. Taken together, early adjustment indicators and intervening experiences appear to be strong links in facilitating early school success.

School adjustment is a process of multiple and complex influences occurring over time. Early school adjustment, from kindergarten through the primary grades, is no different and may be even more critical since the initial transition to schooling may substantially affect later experiences both in and outside of school. Yet an understanding of early adjustment of children at risk is only beginning to emerge. The purpose of this study, using data from the Longitudinal Study of Children at Risk, is to trace multiple influences on children's school adjustment from preschool to grade 4. In this paper, risk is defined as sociocultural risk or the "impoverishing of the child's world so that the child lacks the basic social and psychological necessities of life" (Garbarino, 1982, p. 32). Children's primary risk factor is poverty which leaves them vulnerable to associated developmental problems.

The early school adjustment of children at risk of low academic achievement and school failure is of great concern to educators, researchers, and policy makers alike because they, more than other children, have the most to lose from poor school adjustment. The increasing prevalence of children at risk makes their potential problems even more troublesome since the number of children living in poverty increased 26% from 1979 to 1989 (Center for the Study of Social Policy, 1991). Moreover, projections into the next century indicate continued growth of children in poverty, leaving over four million more children in poverty in 2020 than in 1987 (Natriello, McDill, & Pallas, 1990).

This trend has costs not only to children themselves but to the educational and social institutions which serve them. For example, the greater prevalence of children at risk almost certainly would lead to increased expenditures for educational programs since many of these children would lack adequate readiness skills. Moreover, greater numbers of at-risk children have social and economic costs since at-risk children are more likely to drop out of school, which is associated with unemployment, delinquency, crime, and welfare dependency (Steinberg, Blinde, & Chan, 1984). Identifying and understanding the factors that affect their early school success may not only shed light on improving their adjustment but help prevent future problems of children as well as the institutions which serve them.

Research Context

Previous studies have aptly demonstrated that no single factor is responsible for shaping children's school adjustment. Rather, adjustment is most accurately viewed as a function of mediated effects whereby intervening experiences transmit the effects of various "intake" characteristics which may include sociodemographic or "readiness" attributes such as parental education, socioeconomic status, preschool experience, and cognitive preparedness. Thus, school adjustment is dependent on many factors that interact in complex ways over time. Studies with at-risk children have found that social-psychological

factors play a significant role in early success including, cognitive readiness at school entry (Berrueta-Clement et al., 1984; Reynolds, 1989a, 1989b), teacher ratings of school progress (Berrueta-Clement et al., 1984; Lazar & Darlington, 1982; Reynolds, 1989a, 1989b), home environmental conditions (Slaughter & Epps, 1987; Clark, 1983), school mobility (Felner, Primavera, & Cauce, 1981; Levine, Wesolowski, & Corbett, 1966; Reynolds, 1989a, 1989b), and parent involvement in school (Reynolds, 1989a; Stevenson & Baker, 1987). Such mediating influences are consistent with structural models of the early schooling process (Alexander & Entwisle, 1988; Entwisle, Alexander, Cadigan, & Pallas, 1987; Entwisle & Hayduk, 1982).

The importance of the intervening home, school, and social context in early school adjustment is no more apparent than in studies of the effects of preschool intervention programs. The well-known findings of the Consortium of Longitudinal Studies (Lazar & Darlington, 1982) as well as the Perry Preschool Program (Berrueta-Clement et al., 1984) suggest that participation in preschool programs improves cognitive achievement only to the extent that it improves children's cognitive readiness on school entry, is reinforced by positive teachers ratings after the cessation of preschool, and reduces the likelihood of grade retention and placement in special education classrooms. Reynolds (1991), investigating the impact of a government-funded preschool program for low-income, minority children in Chicago, also found that preschool participation by itself was relatively unimportant in cognitive achievement and grade retention by grade 3 but depended on the degree to which children began school cognitively ready, their grade 1 teachers rated them well-adjusted, and their parents were involved in school after the cessation of preschool. For example, children who participated in at least one year of preschool and whose parents were involved in their education were more likely to perform better in school than children who had preschool but whose parents were not so involved. Moreover, school mobility and grade retention contributed significantly to year 3 achievement as well as played indirect roles in the transmission of preschool effects. These studies support the view that preschool as well as school adjustment generally is dependent on the social context children enter subsequent to preschool (Woodhead, 1988).

The above studies support the importance of models of the early schooling process with at-risk children and the value of capturing mediating effects of variables over time. However, the validity of these studies depends on the consistency of results over time and across contexts, both of which have not been extensively investigated due to the preliminary and evolving nature of studies to date. For example, the stability of effects of parent involvement and school mobility must be verified and greater consensus about the most critical components of the early school process must be achieved (Reynolds, 1989a, 1989b). Also, many previous studies of the early schooling process use cognitive achievement as the primary outcome, yet early school adjustment denotes multiple outcomes that may best be viewed under the concept of competency (Sternberg & Kolligian, 1991; Zigler & Trickett, 1978). This broader conceptualization of adjustment, reported from multiple sources, considers social, affective, and cognitive factors as equally important outcomes. Furthermore, it is important for models to take account of major transitional periods in early school adjustment such as the transition to full-time schooling in kindergarten and first grade (Alexander & Entwisle, 1988) and beginning reading instruction (Chall, Jacobs, & Baldwin, 1990), which are watersheds in academic and social development. Particularly useful are longitudinal studies that trace the adjustment of the same individuals continuously through these major transitional periods.

The present study builds upon the above issues by testing a continuous longitudinal model of early school adjustment. The model is designed to better understand the factors that influence a wide range of early school outcomes including, cognitive readiness on school entry, cognitive and teacher-rated adjustment in grade 1, and four measures of school competency in grade 4: grade retention, cognitive achievement in reading, teacher ratings of school adjustment, and child perceptions of school competency.

A General Model of School Adjustment Through Grade 4

Figure 1 displays a model of early school adjustment through the beginning of elementary school (grade 4). The model is revised and extended from previous good-fitting models of grades 1 to 3

(Reynolds, 1989a, 1989b, 1990). As shown, it incorporates (1) "readiness" or school entry attributes of children in kindergarten, (2) early adjustment factors in kindergarten and grade 1, and (3) intervening experiences in grades 2 to 4 including, support-based factors (exposure to follow-up program services, parent involvement in school, and children's literacy orientation) and school life-events (grade retention, school mobility, and special education placement). These sequential blocks predict the final outcomes of cognitive achievement in reading, teacher ratings of children's school adjustment, and child perceptions of school competence.

The basis of this recursive model is that school adjustment is a series of mediated effects of individual, family, and school-based factors which provide the social context of schooling. The model is designed to answer four major questions of early school adjustment.

1. Which factors predict children's cognitive readiness on school entry?
2. Which factors are associated with early school adjustment in grade 1?
3. What is the degree to which intervening support-based and school life-events influence grade 4 outcomes over and above that of early indicators of school adjustment?
4. What are the primary links between these important periods of schooling?

Insert Figure 1 about here

As shown in Figure 1, readiness attributes include sex, age, participation in government-funded preschool programs (Head Start or a similarly designed Child-Parent Center program), school socioeconomic status (SES), and two family background attributes: parent education, and socioeconomic status as indicated by a child's eligibility for free lunch. All have been associated with cognitive and affective outcomes of schooling (Bloom, 1976; Reynolds, 1989b; White, 1985-1986). They are expected to predict cognitive readiness on school entry, a consistent and enduring correlate of later school outcomes (Butler, Marsh, Sheppard, & Sheppard, 1985; Reynolds, 1989b).

Pre-reading achievement at the end of kindergarten is expected to be linked to the grade 1 outcomes of reading achievement and teacher ratings of adjustment. Initial reading achievement in grade 1 is an important watershed in children's early schooling that may substantially predict later school success in reading and other subjects (Chall, Jacobs, & Baldwin, 1990). Teacher ratings of school adjustment in early schooling have shown to be power influences on later school success (Entwisle & Hayduk, 1988; Berrueta-Clement et al., 1984). Both factors were expected to mediate the effect of readiness attributes on grade 4 outcomes.

Also shown in Figure 1 are two sets of intervening factors. The first set is designed to enhance or support children's learning, especially parent involvement in school activities, children's literacy orientation, and the provision of follow-up services after kindergarten. Previous studies, for example, have found that parent involvement in school activities as reported by teachers is significantly related to children's achievement as well as teacher ratings of school adjustment (Reynolds, 1989b; Stevenson & Baker, 1987). Children's literacy attitudes and behaviors may also enhance adjustment. Snow et al. (1991), for example, found that the home literacy environment of low-income families, measured by the conduct of educational activities (e.g., reading) and provision of learning materials (e.g., books) was positively and significantly related to children's vocabulary and word meaning scores. Although other studies are equivocal on the effects engagement in and provision of literacy activities for at-risk children (e.g., Beal, Breglio, & Hinckley, 1979; Tizard et al., 1988), additional studies are needed to clarify the state of knowledge.

In contrast to the above supportive factors, school life-events (school mobility, special education placement, and grade retention) are potentially disruptive factors in school adjustment that may limit children's early school success. The negative effect of grade retention on later cognitive achievement, for example, has been a consistent finding of previous research (Holmes, 1989). School mobility (Felner,

Primavera, & Cauce, 1981; Levine, Wesolowski, & Corbett, 1966; Reynolds, 1989b) and special education placement (Lazar & Darlington, 1982) have also been linked to school maladjustment. These life-events are posited to have negative influences on early school adjustment.

The sequencing of the factors, with the exception of family background attributes, is based on the time period in which they were measured, taking advantage of the longitudinal design. Readiness attributes, for example, causally precede other factors on conceptual and temporal grounds because their influence is exerted well before kindergarten. Likewise, early adjustment indicators, measured in kindergarten and grade 1, influence intervening experiences and grade 4 outcomes. Moreover, school mobility and special education placement were measured at the end of grade 2, one year prior to grade retention. Consequently, both are expected to influence grade retention rather than the reverse. Because the intervening factors of support-based factors and school life-events were measured at approximately the same time, no causal direction was hypothesized between these blocks.

For completeness, all paths implied by the model in Figure 1 were estimated, however, the primary effects were hypothesized as follows: Preschool participation (particularly CPC preschool) will show its greatest effect on cognitive readiness. Parent education and SES (measured by children's eligibility for a lunch subsidy) will also significantly influence cognitive readiness. Grade 1 adjustment measures will be influenced by prior cognitive measures, especially pre-reading achievement, cognitive readiness, family background, and preschool participation. Both support-based services and school life-events will substantially mediate the effects of early school outcomes and readiness attributes, however, school life-events, especially grade retention and mobility, will be more strongly related to grade 4 outcomes (most notably reading achievement).

Method

Sample

Children in this study are part of the Longitudinal Study of Children at Risk, an on-going investigation tracing the school adjustment of an initial panel of 1540 children in the Chicago Public Schools (Reynolds, Hagemann, Bezruczko, & Mavrogenes, 1991). These low-income, minority children enrolled in one of four government-funded kindergarten programs in the Chicago Public Schools in the fall of 1985. Included are all children in Chapters 1 and 2 Child-Parent Centers (CPC) that have kindergarten, all children in Chapter 2 all-day kindergarten programs, and a random sample from 6 schools in the Chicago Effective Schools Project (CESP), a local kindergarten program. CPCs provide comprehensive, language-based preschool programs for low-income children with educational need and have demonstrated successful implementation (Chicago Public Schools, 1987). In the spring of 1990, most children were in grade 4 (because many children were retained, year in school is a better descriptor than grade level; for clarity, however, grade level will be used). By definition, the sample is representative of children in government funded early childhood programs, thus fairly well represents children at risk due to poverty in Chicago and probably other large metropolitan school districts.

Insert Table 1 about here

Table 1 provides a description of sample characteristics of 1255 (80% of the original sample) children who remained in the school system in grade 4 (the 1989-1990 school year) and who spent at least three years in the Chicago Public Schools from kindergarten to grade 4. The sample retention rate of 80% is high given that the typical rate over three waves is about 50% (Kessler & Greenberg, 1981). The analyses reported in this study are based on this sample of 1255 children, which is similar to the original sample on nearly all characteristics. To obtain the final sample, missing data on test scores were imputed for some

cases.[1] The data reported in Table 1 were collected from school records and parent surveys mailed in spring of grade 2 (1988) and grade 4 (1990).

As shown in Table 1, the children were at multiple risk of school difficulties. All children were ethnic minority and attended kindergarten schools in poverty neighborhoods. Over 90% of the surveyed parents reported their child was eligible for a partial or full lunch subsidy. A substantial number of parents (41%) reported that they did not graduate from high school, although, because of missing data and unreliability of parent reports, this may be a conservative estimate. However, there were few observed differences in outcomes between children whose parents were missing and not missing on parent education. Also, note that a substantial number of children (70%) attended government-funded preschool in Chicago.

Measures

A description of the measures is provided in Table 2 and follows directly from Figure 1. They include preschool enrollment through the grade 4 outcomes of cognitive achievement in reading, teacher ratings of children's school adjustment, and child self-perceptions of school competency. Reading achievement was measured by the Iowa Tests of Basic Skills (ITBS; Hieronymus, Lindquist, & Hoover, 1980a) which has demonstrated high reliability and predictive validity (Hieronymus, Lindquist, & Hoover, 1982). Scores are reported in equal-interval logit values based on one-parameter item response theory methods (transformed from grade-equivalencies).[2] Teacher ratings of school adjustment came from a reliable (Rel. = .94), six-item scale administered in the spring of 1990. Self-perceptions of school competency were indexed by 12 items administered to children the spring of grade 4. Derived from principal components analysis, the scale had acceptable internal consistency reliability (Rel. = .75). A fourth measure of school adjustment was grade retention, defined as children who were not at their expected grade level (grade 4) during the 1989-90 school year. Thus, they were retained in either grade 1, grade 2, or grade 3. No children in this sample were retained in kindergarten.

Insert Table 2 about here

Readiness attributes include sociodemographic factors of sex and age at entry in kindergarten. The family variables include parent education (high school graduate or not), and an ordinal indicator of family income, children's eligibility for a federal lunch subsidy. Both were obtained in grades 2 and 4 through parent survey questionnaires. Although these socioeconomic variables were measured after children's school entry, they were expected to be fairly stable indicators, especially given the sample's at-risk status. Because of substantial missing data on parents education and income, a missing-data dummy variable was created to test for nonresponse bias. School SES in kindergarten was included as a measure of the socioeconomic context of the kindergarten school and the likely area where a child has grown up. Two measures of preschool participation were included; enrollment in CPC preschool programs and enrollment in Head Start. Most of the children in this sample had CPC preschool. It should be noted that parental marital status, surveyed in grade 4, was not included as a primary variable due the small number of parents who provided this data ($\underline{n}$ = 492) and that it added no explanatory power above and beyond other variables. The final readiness factor is cognitive readiness on school entry often called "developmental preparedness." It was reliably measured by the Iowa Tests of Basic Skills (Hieronymus, Lindquist, & Hoover, 1980b).

Also reported in Table 2 is a measure of pre-reading achievement which is based on the word analysis subtest of the ITBS. Grade 1 outcomes include baseline reading achievement from the ITBS and teacher ratings of children's school adjustment; both are conceptually similar to their respective grade 4 outcomes. The intervening support-based factor of follow-up services was the number of years children received extra services in their kindergarten CPC including a slightly reduced class size, extra supplies for books, and a teacher aide for each class. Parent involvement in school activities was assessed by grade 2 teachers, independent of all other teacher measures. Children's literacy orientation, self-reported in the spring of

grade 3, measured their engagement in and attitudes toward literacy activities in and outside of school (e.g., "I read at home", "I write notes to my friends and family"). The scale, derived from principal components analysis had a moderately high internal consistency reliability (r = .60). The final measures, school mobility and special education placement were collected prior to grade 4.

Results and Discussion

Descriptives

Means and standard deviations of the outcome and explanatory factors are shown in Table 2. Inspection of the correlations among factors verified that they measured separate but related dimensions of the schooling process. For example, participation in CPC preschool was positively associated with cognitive readiness (r = .22). Cognitive readiness was moderately correlated with grade 4 reading achievement (r = .43) as well as grade 4 teacher ratings (r = .29). Surprisingly, however, children's literacy orientation was negligibly related to grade 4 reading achievement (r = -.002) and to teacher ratings (r = .017).

The grade 4 outcomes of reading achievement, teacher ratings, child perceptions of competency as well as grade retention were moderately correlated suggesting they tapped conceptually different constructs. Grade retention and reading achievement had the highest correlation (r = -.57), grade retention and child perceptions of competency the lowest (r = -.10). The correlations between reading achievement and teacher ratings of children's school progress (r = .46) and between teacher ratings and child perceptions of competency (r = .48) were moderate. As expected, grades 1 and 4 reading achievement and grades 1 and 4 teacher ratings, as expected, were strongly correlated (rs = .60, .46, respectively; contact the author for the complete correlation matrix).

Longitudinal patterns of reading achievement for the 1255 at-risk children are shown in Figure 2. Achievement patterns indicate that while 65% of the sample performed at or above the national grade-level average in kindergarten, over time children's performance declined substantially as only 23% of the sample was performing at the national average in grade 4. Note that the achievement trend does not strictly support the so-called grade 4 "slump" (Chall et al., 1990; Torrance, 1968); the percentage drop was greater in grade 1 and the decline is continuous rather than abrupt. This illustrates the advantage of muli-wave panel data.

Obviously, there are many possible reasons for this decline. One is that the early effects on achievement of preschool and kindergarten interventions have faded, which is consistent with many previous studies (White, 1985-1986). A second possible reason for declining achievement is school practices of grade retention. By grade 4, 20% of the sample had been retained, over one-half (11%) in grade 1. The negative and high correlation between grade retention by grade 4 and reading achievement at the end of grade 4 is indicative of retention's potentially disruptive effects. Finally, the instability of children's school learning environments may play a role in their relative decline in achievement over time. By grade 4, 56% of the children had changed schools at least once since kindergarten. Moreover, these children, who began kindergarten in 26 schools, enrolled in over 300 different schools by grade 2.

Insert Figures 2 and 3 about here

As shown in Figure 3, longitudinal patterns in teacher ratings of school adjustment convey a somewhat different picture. These ratings are based on the sum of six identical or comparable items (using a 5-point Likert scale) for 632 children. Although ratings are fairly low (Ms around the 50% ile of the scale, which ranges from 6 to 30), there is high stability over time. This trend suggests that teacher ratings of children's progress may not be as greatly influenced by such factors as grade retention, school mobility, or school-based programs as achievement.

As a final descriptive note, children's perceptions of their school competence were not consistent with their rather marginal level of performance in reading achievement and teacher-rated school adjustment in grade 4. The average rating of 28.7 (on a scale from 12 to 36) is much higher than would have been predicted from the measures of cognitive achievement, retention, and mobility. This finding suggests that children's perceptions of competence are resilient against their unstable early school experiences.

Regression Analyses

Hierarchical multiple regression analysis was used to determine the contribution of variables to the school adjustment model (using pairwise-present cases for the non-achievement factors). As shown in Table 3, the explanatory variables contributed in diverse ways to the explanation of variances in the outcomes. The readiness attributes showed their greatest influence on school entry cognitive readiness. Over time, however, intervening school experiences substantially mediated the effects of readiness attributes. Further note that the influence of missing parent data was relatively small. It was significant in only two of the seven models estimated.

The results summarize the four major questions discussed in the beginning of the paper. Which factors contribute to children's cognitive readiness? Which factors predict cognitive and affect adjustment in grade 1? How can variation in grade 4 outcomes be best explained? How can the trends across time be best described?

Insert Table 3 about here

Cognitive Readiness

There were a number of significant predictors of cognitive school readiness, among them participation in Child-Parent Center (CPC) preschool programs ($\underline{b}$ = .24), age at school entry ($\underline{b}$ = .21) as well as parent education ($\underline{b}$ = .17), and eligibility for free lunch (a measure of SES; $\underline{b}$ = .15). All of these were in the expected direction. That CPC preschool's greatest direct effect was short-term is consistent with many previous studies (Haskins, 1989; White, 1985-1986). The negligible effect (although in the expected direction) of participation in Head Start preschool illustrates that substantial effects of preschool on child outcomes are not inevitable.

Grade 1 Reading Achievement

Initial reading achievement is an important outcome for children at risk because it helps set the stage for performance in school as well as later school adjustment. As expected, earlier cognitive factors had the greatest influence on initial reading achievement including, pre-reading achievement at the end of kindergarten ($\underline{b}$ = .38) and cognitive readiness at school entry ($\underline{b}$ = .22). That cognitive readiness continued to exert a strong influence on early primary-grade achievement illustrates its unique contribution to school success. Other notable findings included the positive effects of CPC preschool participation and sex (in favor of girls) over and above that of other factors. Again, Head Start participation was negligibly related to achievement.

Grade 1 Teacher Ratings of Children's Progress

As with reading achievement, prior cognitive measures had the greatest influence on this affective outcome. However, some differences emerged. Sex (in favor of girls) contributed more to teacher ratings of school adjustment than to achievement. Preschool participation (CPC and Head Start) did not influence teacher ratings, nor did family background characteristics. These results suggest that teacher ratings of school adjustment depend predominantly on physical (i.e., sex) and cognitive factors (i.e., achievement).

Grade Retention

There were three significant predictors of grade retention: teacher ratings of progress, cognitive readiness, and school mobility. Surprisingly, family background attributes and grade 1 achievement did not significantly contribute to retention. Evidently, teacher judgements play a much greater role than

achievement per se, although the high correlation between teacher ratings and grade 1 achievement (r = .60) may have reduced the achievement-retention relationship. The influence of school mobility indicates that children who change schools are more likely to be retained-in-grade. This is consistent with the notion that school mobility represents an environmental disruption that may, at least in the short-term, contribute to school maladjustment since children must adapt to new schools, new teachers, and new friends. It is notable that the effect of mobility was above and beyond that which could be explained by sociodemographic factors including, parent education, socioeconomic status, and school SES. This result supports the unique and positive influence of changing schools on grade retention. However, the effect of mobility may vary as a function of unmeasured factors such as the distance moved and the reason for moving.

Grade 4 Reading Achievement

As shown in Table 3, a substantial amount of variation in reading achievement (R^2 = .545) was explained by the variables in the model. It should be noted that since initial reading achievement was entered in the model, coefficients are directly interpretable as explaining growth in reading achievement. The major result of the model is the substantial negative effect of grade retention (b = -.33) on reading achievement in grade 4, which is larger than the effect of initial reading achievement in grade 1. This coefficient represents a difference of nearly one (.82) standard deviation between ever-retained and continuously promoted children. Moreover, because the observed effect of retention on later achievement takes into account initial differences among students such as age, family background, teacher ratings, and initial achievement, it is unlikely that selection artifacts inflated the retention effect.

Cognitive readiness, grade 1 reading achievement and teacher ratings, parent involvement, and age (in favor of younger children) also contributed significantly to growth in reading. The effects of program follow-up services, school mobility, and child literacy orientation were surprisingly negligible. The difficulty in separating exposure to follow-up services from school mobility may have contributed to the lack of effects of both factors since the number of years in the CPC follow-up programs is inversely related to school mobility (r = -.53). However, separate estimation of their effects did not change the results presented here.

Grade 4 Teacher Ratings of Adjustment

The differential effects of the predictors were evident in explaining growth in teacher-rated adjustment. Unlike the results for achievement, grade retention had no effect on teacher ratings of adjustment. Also, sex (in favor of girls), school SES, and Head Start preschool participation significantly influenced growth in ratings. The latter two effects, however, were in the opposite direction expected, which may be the result of regression to the mean since children in low-SES schools and who did not have preschool are likely to be initially rated lower than their peers. As with achievement, grade 1 reading achievement and teacher ratings, and parent involvement in school had significant positive influences.

Grade 4 Perceived Competence

Only prior measures of achievement and teacher ratings explained variation in perceived competency, which illustrates that children's perceptions of competence are dependent on their initial school success and teacher perceptions of children's progress. The lack of effects of other factors and the low explanatory power of the model (R^2 = .133) may be due to the low variation in child perceptions of school competency (See Table 2). Surprisingly, most children's perceptions of school competence were quite high.

Summary of Variance Contributions

Table 4 summarizes the results of the regression analysis in terms of unique variance explained in the four major measures of early school adjustment. These results show that substantial amounts of variance in the outcomes are explained by mediating factors above and beyond that of readiness attributes. This was especially apparent for cognitive growth in reading whereby 74% of the growth-related variance (14% / 19%) was attributable to the intervening factors of teacher ratings, support-based factors, and school life-

events. The life-event of grade retention, however, contributed the most unique variance. Grade retention and child perceptions of competence were also substantially mediated by grade 1 and intervening factors. One exception to this trend was teacher ratings of school adjustment as support-based and school life-event mediators contributed very little to its prediction over and above readiness attributes.

Insert Table 4 about here

Links Among Factors Over Time

Although the magnitude of effects varied by outcomes, these results support early school adjustment as a process of mediated effects involving individual, family, and school-based factors. They are also consistent with conceptual (Bronfenbrenner, 1975; Woodhead, 1988; Haskins, 1989) and empirical specifications (Alexander & Entwisle, 1988; Entwisle & Hayduk, 1988; Reynolds, 1991). Entwisle and Hayduk (1988), for example, found that teacher and parent ratings of children in early schooling contributed to lasting effects on school performance in middle school.

Most apparent in the present study are the continuing effects of cognitive readiness on school entry and initial cognitive and affective adjustment in grade 1. Not only do they exert independent influences on children' adjustment but they transmit the effects of other factors, especially preschool. This latter contribution is illustrated by CPC preschool's effect on cognitive readiness and grade 1 achievement, both of which affect grade 4 achievement and child perceptions of school competency.

These paths, illustrated in Figure 4, show the mechanisms through which continuity in early schooling may be enhanced. In Part A, preschool is linked to grade 4 achievement by cognitive readiness, grade 1 outcomes, and grade retention. Thus, school adjustment is more likely if participation in preschool is followed by positive teacher ratings, higher achievement and if grade retention is avoided. As shown in Part B, these mechanisms (except retention) are also linked to self-perceptions of school competency in grade 4. This is the first available evidence that preschool positively influences (indirectly) children's perceived competency.

Insert Figure 4 about here

General Discussion and Conclusion

Children growing up in poverty face a number of difficulties which reduce their chances for successful school adjustment. In this study, children's early school experiences were marked by declining patterns of achievement, frequent school moves, and increasing grade retention. Yet many of the factors influencing their school adjustment, objectively and subjectively measured, appear alterable in educational settings.

One is grade retention. Retention was conceptualized as a life event having a potentially disruptive influence on children's adjustment by limiting their exposure to more advanced curricula and disturbing their sense of self. Its negative effect on later cognitive achievement in reading suggests that this school practice is a powerful contributor to children's declining achievement over time (See Figure 2). Although the results of this study do not prove that retaining children always causes lower achievement, they do provide a more rigorous test of the true effects of retention than many previous studies (Holmes, 1989) since the observed coefficient is adjusted for differences in family background, cognitive readiness, initial achievement, teacher ratings of school progress, and school mobility -- factors that presumably cause children to be retained. However, it should be noted that negative retention effects are not omnipresent since they did not influence teacher ratings or children's perceptions of school competency.

Another important finding of this study concerns the predictors of children's perceived competency. Results indicated that early cognitive factors (cognitive readiness and grade 1 reading achievement) as well

as teacher ratings play a role in children's perceptions of competency three or four years later. This provides further evidence of the importance of the initial transition to school in kindergarten and first grade. Although competency-based measures are increasingly used as important child outcomes (Sternberg & Kolligian, 1991), studies are only beginning to document the range of factors that influence it. Fewer still, if any, have considered the perceptions of at-risk children. However, that preschool was linked to children's perceived competency indirectly vita cognitive readiness and grade 1 outcomes (see Figure 4) illustrates the importance of early school outcomes in predicting adjustment.

In conclusion, however, more questions were raised than answered in this study. While factors that contribute to school adjustment over time were probed and linked, a number of issues deserve further study. First, children's literacy orientation had no effects on measures of adjustment. It should not be concluded, however, that engagement in literacy activities does not influence children's cognitive and affective development. The low variation in children's reports probably contributed substantially to this result. Future studies need to include measures that discriminate between high- and low-competency children through alternative measurement strategies such as interviews or reports from significant others (e.g., parents). Low variation in reports may also explain the relatively low variance explained (13%) in child perceptions of competence.

Second, although mobility did influence grade retention, that it had no effect on grade 4 achievement is not consistent with previous studies of this sample in grades 1 to 3 (Reynolds, 1989b, 1991). This indicates the effects of mobility fade substantially in grade 4. Although it is possible that children get acclimated to such frequent school moves over time, especially as they get older, the nature of this inconsistency should be further investigated. More detailed studies of the determinants of mobility and the extent to which it is independent of family economic hardship are warranted.

That grade retention did not influence teacher ratings of school progress and children's perceived competence is curious and suggests that retention may not disrupt children's psychological functioning as much as expected. Why does retention significantly influence achievement much more that affective factors? It may be that young children do not interpret retention as failure, thus they are relatively immune to its psychological consequences. Additional studies of the effects of retention practices on non-cognitive outcomes are needed. Efforts to answer some of these questions and others may provide further insight to the factors influencing the school adjustment of children at risk. Continued longitudinal investigations appear to be particularly appropriate for this task.

Footnotes

1. To be included in the final sample, the following three conditions had to be satisfied: (a) children must have a valid identification number, (b) they must have been active in the Chicago Public Schools in kindergarten, grades 3 and 4, and (c) could not have more than five missing test scores from kindergarten to grade 4 (11 reading and mathematics scores were possible). Test scores of children satisfying these three conditions were imputed in the following manner. Those missing one score (reading or mathematics) within a particular grade were given the value of their valid score that year. Children missing both reading and mathematics scores for a particular year were assigned subgroup means based on their kindergarten program group and if they were retained during that year. For the entering school cognitive readiness and kindergarten achievement, imputations were based on children's kindergarten program group and their parents' educational background (high school graduate or nongraduate). The imputations did alter the variances of scores, with the exception of entering school cognitive, which had a variance reduction from .24 to .18 (about 350 cases were imputed).
2. Test score conversions are based on 1977-1978 norms. In the spring of 1990 the Chicago public school system began using 1988 norms in computing scores.

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Table 1

Sample characteristics for the Longitudinal Study of Children at Risk (N = 1255)

Characteristic	Percent	Sample size
Race/ethnicity	95% Black	1191
	5% Hispanic	60
Sex	51% girls	640
	49% boys	615
Age at kindergarten entry	74% More than 60 months	906
	26% Up to 60 months	325
School SES in kindergarten	100% poverty-designated neighborhoods (range = 45-86% low-income)	1255
Parent education	59% high school graduate	430
	41% less than high school	307
Eligibility for federal lunch subsidy	85% full subsidy	629
	8% partial subsidy	61
	6% no subsidy	47
Missing parent education/lunch subsidy	41% not known	518
	59% known	737
Number of siblings	18% none	188
	54% 1-3	573
	28% 4-6	296
Preschool experience	70% CPC or Head Start	873
	30% none	382
Program participation	44% Ch 1 CPC	551
	21% Ch 2 CPC	257
	10% Ch 2 Home School	130
	25% CESP	317

Note. Ns may not add up to 1255 due to missing data.

Table 2

Variable definitions, means, and standard deviations for model

Variable	Definitions	M	SD
	Grade 4 Outcomes		
Cognitive achievement in reading	ITBS reading comprehension subtest Level 10 in logits	-1.57	1.16
Teacher ratings of school adjustment	Sum of six 5-point teacher rated items: Concentrates on work, Follows directions, Is self-confident, Participates in group discussions, Gets along well with others, and Takes responsibility for actions	18.93	5.40
Grade 4 perceived school competence	Sum of 12, 3-point self-rated items: I get good grades in school, My classmates like me, I get in trouble at school, I get along well with others, I do my homework, I answer questions in class, I give up when school work gets hard, When I get bad grades I try even harder, I try hard in school, My teacher thinks I will go far in school, I am smart, I do better in school than my classmates	28.71	4.10
	Explanatory Variables		
Readiness Attributes			
Sex	1 = girls, 0 = boys	.51	.50
Age at school entry	in months	63.41	3.73
Parent education	1 = high school graduate, 0 = < high school	.58	.49
Eligibility for free lunch	3 = no subsidy, 2 = partial subsidy, 1 = none	1.21	.54
Missing parent education or eligibility for free lunch	1 = missing, 0 = not missing	.41	.49
School socioeconomic status	Percentage of families in school region who are not low-income (in Kindergarten)	33.21	9.44
Child-Parent Center preschool	1 = CPC preschool, 0 = otherwise	.64	.48
Head Start preschool	1 = Head Start, 0 = otherwise	.06	.23
Cognitive readiness	Cognitive readiness on school entry, ITBS Level 5 in logits	-6.38	.84
Early Adjustment Indicators			
Grade K pre-reading achievement	End-of-kindergarten word analysis skills ITBS Level 5 in logits	-5.00	.87
Grade 1 reading achievement	Baseline measure of reading comprehension ITBS Level 7 in logits	-4.06	1.13
Grade 1 teacher ratings of school adjustment	Sum of six, 5-point items about children's adjustment: Came to class ready to learn, completes work according to instructions, complies with classroom rules, displays confidence in approaching learning tasks, participates in group discussions, and works and plays well with others	19.21	5.80
Intervening Experiences			
Support-based factors			
Follow-up services in grades 1 through 3	Number of years receiving CPC follow-up services including extra funds for supplies and teacher aides in grades 1 through 3	1.23	1.20
Year 2 parent involvement in school	Teacher rating: 5 = excellent/much, 1 = poor/not at all	2.64	1.21
Child literacy orientation	Sum of six 3-point self-rated items: I like to write stories, I like to read, I like science, I talk about school at home, I write notes to my friends or family, and I read at home	13.36	2.52
School life-events			
School mobility	Number of school moves from kindergarten to grade 3	.69	.87
Special education placement	Placed in special education in grades 1 to 3	.08	.27
Grade retention	Retained in kindergarten, grade 1, grade 2, or grade 3	.20	.40

Note. ITBS = Iowa Tests of Basic Skills.

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Table 3

Regressions of early school adjustments on readiness attributes, early adjustment indicators, and intervening experiences

	Outcome													
	Cognitive readiness		Grade 1 reading achievement		Grade 1 teacher ratings of adjustment		Grade Retention		Grade 4 reading achievement		Grade 4 teacher ratings of adjustment		Grade 4 perceived competence	
Predictor entered:	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta
Readiness Attributes														
Sex (1 = girls)	.14*	.09*	.25*	.11*	2.48*	.21*	-.04	-.05	.09	.04	1.28*	.11*	.07	.01
Age at school entry	.05*	.21*	.01	.02	.08	.05	.01	.01	-.02*	-.07*	-.04	-.03	-.05	-.04
Parent education (1 = grad)	.29*	.17*	.12	.05	.09	.01	-.03	-.03	.10	.04	-.19	-.02	-.15	-.02
Eligibility for free lunch (3 = no subsidy)	.23*	.15*	.20*	.10*	.58	.05	-.02	-.02	.09	.04	.21	.02	.12	.02
School SES	-.01	-.04	.01	.04	.02	.04	.01	.02	.01	.05	-.07*	-.12*	-.01	-.02
Missing parent education and eligibility for free lunch	-.11	-.06*	-.07	-.03	-1.02*	-.09*	-.01	-.01	-.04	-.02	-.43	-.04	-.59	-.07
CPC preschool (1 = CPC)	.43*	.24*	.25*	.10*	.70	.06	.02	.03	-.11	-.04	-.31	-.03	-.56	-.07
Head Start (1 = Head Start)	.14	.04	-.05	-.01	.04	.01	.08	.05	-.17	-.03	-2.25*	-.10*	-.54	-.03
Cognitive readiness			.30*	.22*	1.59*	.23*	-.06*	-.12*	.16*	.11*	.49	.08	.60*	.12*
Early Adjustment Indicators														
Pre-reading achievement			.49*	.38*	1.70*	.26*								
Year 1 reading achievement							-.03	-.08	.29*	.28*	..76*	.16*	.50*	.14*
Year 1 socioemotional maturity							-.02	-.29*	.03*	.17*	.24*	.26*	.13*	.18*
Intervening Experiences														
Support-based factors														
Follow-up support services							-.01	-.04	.03	.03	.19	.04	.09	.03
Grade 2 parent involvement							-.01	-.04	.06*	.06*	.60*	.13*	.21	.06
Child literacy orientation							.01	.06	.01	.01	-.03	-.01	.10	.06
School life-events														
School mobility (after K, 1, or 2)							.06*	.11*	.07	.05	.18	.03	-.04	-.01
Special education (in 1, 2, or 3)							.10	.07	-.07	-.02	-.90	-.05	-.63	-.04
Grade retention (in K, 1, 2, or 3)									-.95*	-.33*	.27	.02	.93	.09
Variance explained	.157		.378		.272		.260		.545		.294		.133	

Note. B = metric coefficient, Beta = standardized coefficient. Missing-data dummy variable was entered with parent education and lunch eligibility removed.
* $p < .05$.

Table 4

Variances explained in Grade 4 outcomes as a function of readiness and intervening factors

Predictors entered; Step:	Variance explained: Unique Variance	Variance explained: Cumulative Variance
Grade retention (from kindergarten to grade 3)		
1. Readiness attributes	.127	.127
2. Grade 1 reading achievement and teacher ratings	.107*	.234*
3. Support-based mediators	.014*	.248*
4. School life-event mediators	.012*	.260*
Grade 4 reading achievement		
1. Grade 1 baseline achievement	.354	.354
2. Readiness attributes	.055*	.409*
3. Grade 1 teacher ratings	.048*	.457*
4. Support-based mediators	.006	.463
5. School life-event mediators	.082*	.545*
Grade 4 teacher ratings		
1. Grade 1 baseline maturity	.208	.208
2. Readiness attributes	.049*	.257*
3. Grade 1 reading achievement	.020*	.277*
4. Support-based mediators	.015*	.292*
5. School life-event mediators	.003	.295
Grade 4 perceived competency		
1. Readiness attributes	.062	.062
2. Grade 1 reading achievement and teacher ratings	.056*	.118*
3. Support-based mediators	.008	.126
4. School life-event mediators	.007	.133

Note. Readiness attributes = sex, age at school entry, school socioeconomic status, parental education, eligibility for free lunch, preschool participation, and cognitive readiness. Support-based mediators = follow-up services, parent involvement, and literacy activiites. School life-events = school mobility, special education placement, and grade retention. Grade retention was excluded when entered as an outcome.

* significant R^2 change at the .05 level.

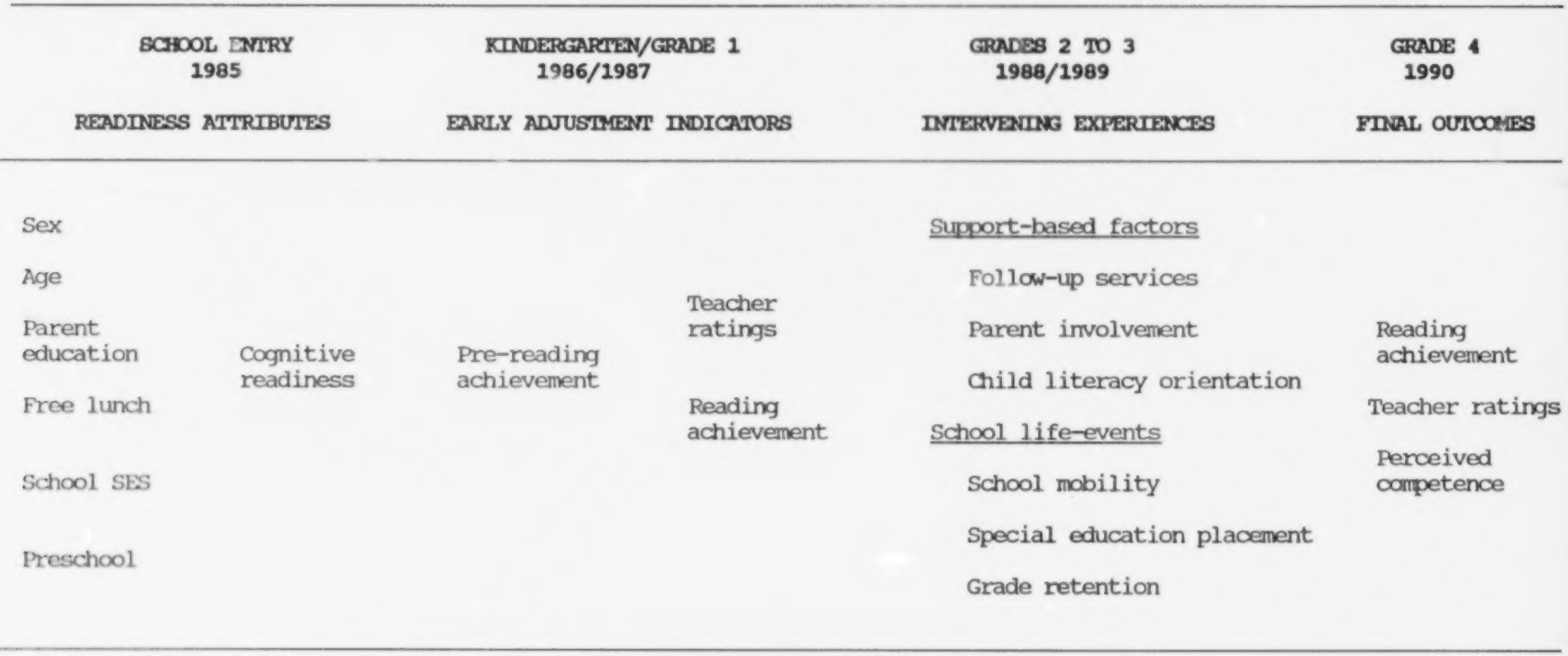


Figure 1. Conceptual model of school adjustment through grade 4.

Figure 2

Reading Achievement
By Grade

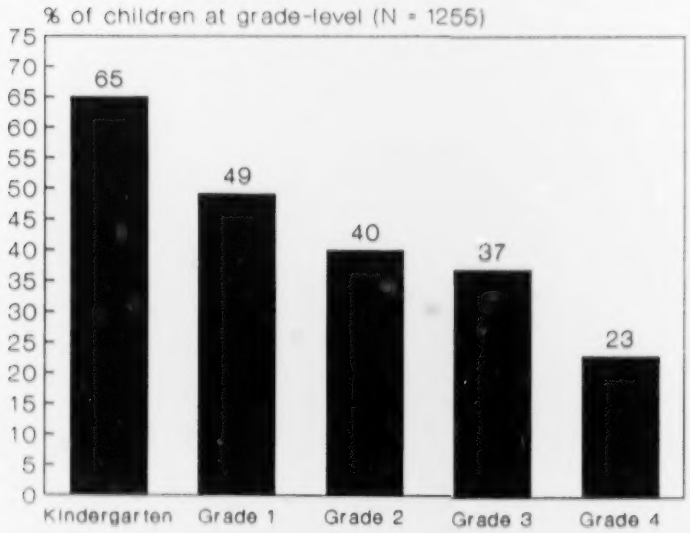
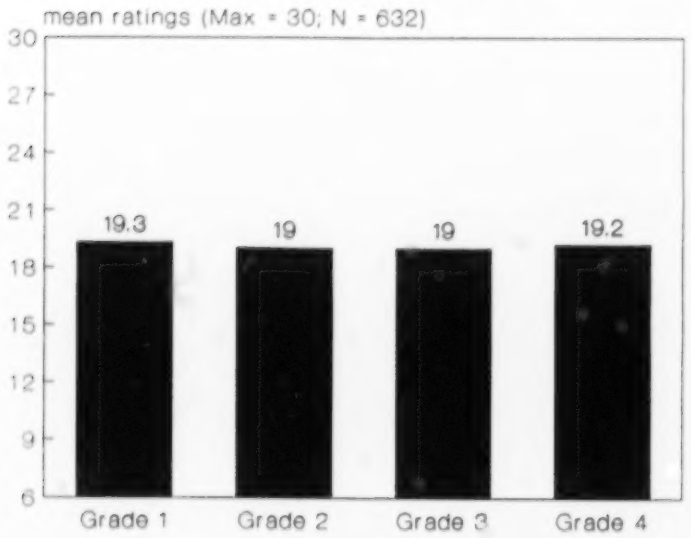


Figure 3

Teacher Ratings of Adjustment
By Grade



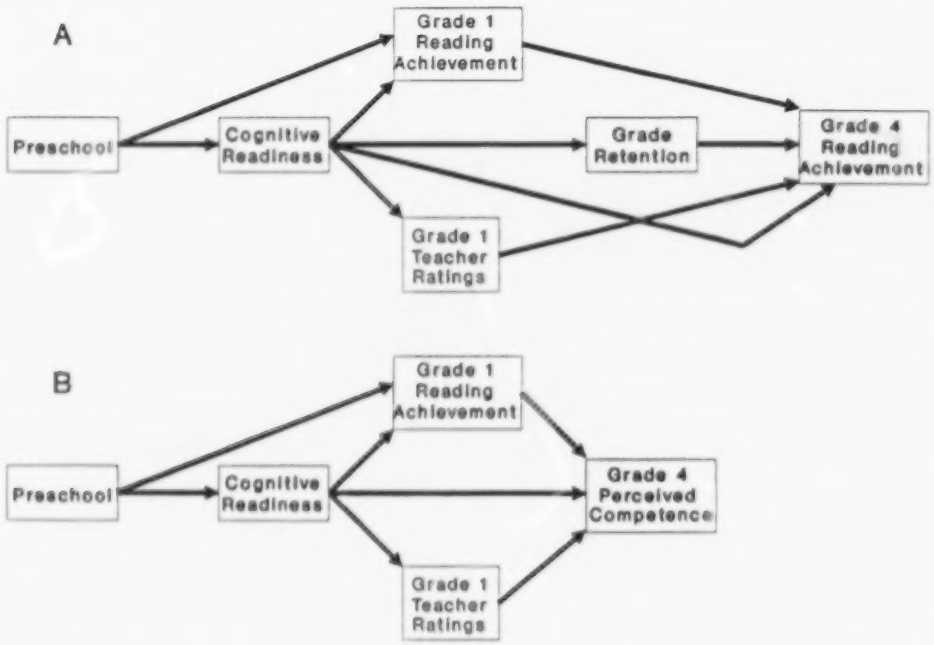


Figure 4. Links from Preschool to Two Grade 4 Outcomes